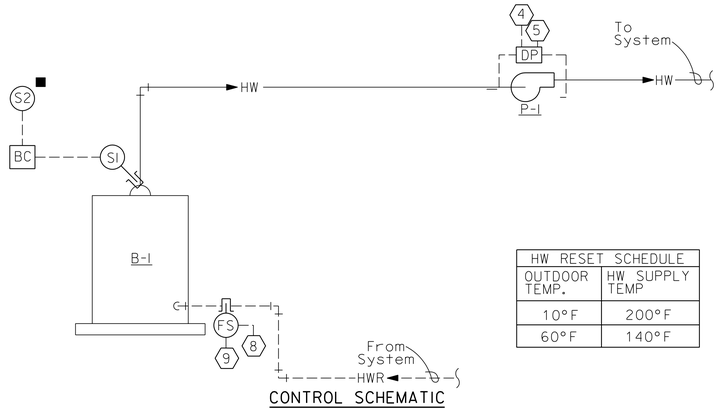
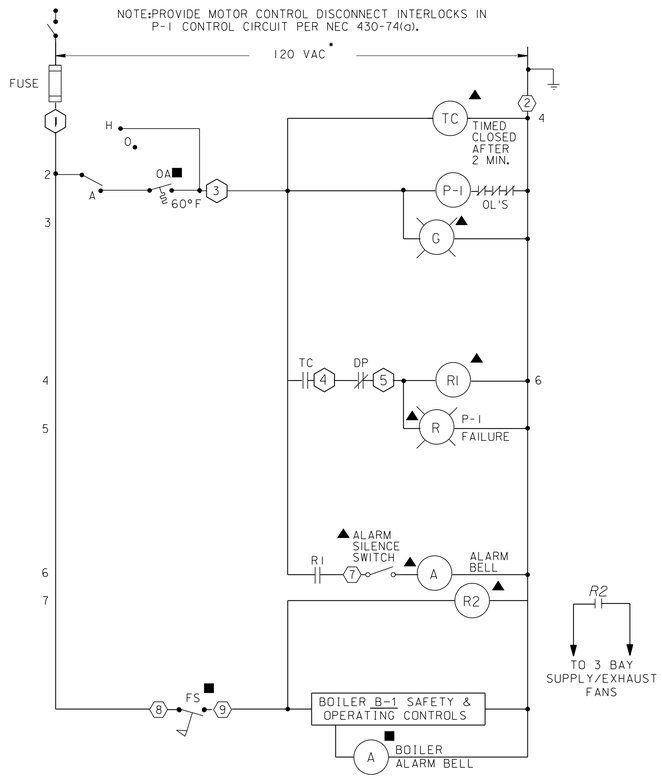


HW RESET SCHEDULE	
OUTDOOR TEMP.	HW SUPPLY TEMP
10°F	200°F
60°F	140°F

CONTROL SCHEMATIC

NOTE:PROVIDE MOTOR CONTROL DISCONNECT INTERLOCKS IN P-1 CONTROL CIRCUIT PER NEC 430-74(a).



ELEMENTARY DIAGRAM

• SEE ELECTRICAL POWER PLANS FOR SOURCE OF CONTROL PANEL (TCP-3) POWER

DESCRIPTION OF COMPONENTS

TC AN INSTANTANEOUS OPEN, TIMED CLOSED RELAY WITH NORMALLY CLOSED 120 VAC CONTACTS. (ADJUSTABLE 0-3 MINUTES).

R1,2 AN ELECTRIC RELAY, 120 VAC COIL, 120 VAC CONTACTS.

FS A REMOTE, ELECTRIC, TWO-POSITION FLUID FLOW SWITCH WHICH CLOSES ON SENSED FLOW.

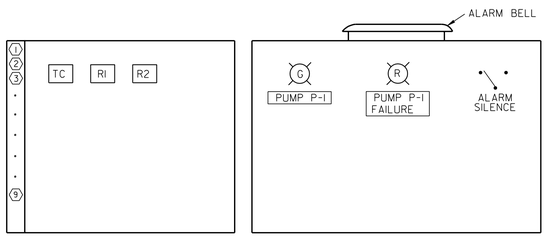
S1 A REMOTE, FLUID IMMERSION TEMPERATURE SENSOR COMPATIBLE WITH BOILER CONTROLLER BC.

S2 A REMOTE, OUTDOOR AIR SENSOR COMPATIBLE WITH BOILER CONTROLLER BC.

DP A DIFFERENTIAL PRESSURE CONTROLLER WITH NORMALLY CLOSED CONTACTS WHICH OPEN UPON SENSED PRESSURE ACROSS THE PUMP.

OA AN ELECTRIC, REMOTE OUTDOOR, TWO-POSITION THERMOSTAT WITH A DIFFERENTIAL OF 4°F (FIXED OR ADJUSTABLE). SETPOINT SHALL BE ADJUSTABLE 40-70°F MINIMUM AND SHALL MAKE ON A DROP IN TEMP.

BC BOILER WATER TEMPERATURE CONTROLLER WITH OUTDOOR RESET CAPABILITY, (PROVIDED BY BOILER MANUFACTURER).



UNIT CONTROL PANEL DETAIL (INTERIOR)
NO SCALE

UNIT CONTROL PANEL DETAIL (EXTERIOR)
NO SCALE

NOTES:

1. INSTALL COMPONENTS IN THE LOCATIONS INDICATED.
2. CONTROL PANEL SHALL BE SECURELY MOUNTED ON WALL WHERE SHOWN.
3. USE A CONSISTANT COLOR CODED WIRING SCHEME.
4. LABEL ALL WIRING ENTERING AT LEAVING THE CONTROL PANEL.
5. CONNECTIONS TO THE ELECTRICAL TERMINAL STRIP SHALL BE IN ACCORDANCE WITH THE CONTROL SCHEMATIC AND ELEMENTARY DIAGRAM.

SEQUENCE OF CONTROL

GENERAL: THE SYSTEM CONSISTS OF A OIL-FIRED BOILER (B-1) WITH MODULATING BURNER AND A HOT-WATER CIRCULATING PUMP (P-1).

PUMP CONTROL: WITH OUTDOOR TEMPERATURES BELOW 60°F (AS DETERMINED BY OA) AND WITH THE HAND-OFF-AUTO SWITCH IN THE "AUTO" POSITION, THE PUMP SHALL BE ENERGIZED. WHEN THE SYSTEM IS ENERGIZED AND AFTER AN INITIAL TIMED DELAY (TC), WHEN LOSS OF FLOW IS INDICATED ACROSS PUMP; INDICATING LIGHT (R) SHALL ENERGIZE AND A LOCAL ALARM BELL SOUNDED.

BOILER CONTROL: A BOILER WATER TEMPERATURE CONTROLLER (BC) SHALL CONTROL THE FIRING RATE OF THE BOILER TO MAINTAIN A SUPPLY TEMPERATURE ACCORDING TO THE RESET SCHEDULE.

THE CONTROLLER SHALL AUTOMATICALLY MODULATE THE BURNER FROM OFF TO LOW FIRE TO HIGH FIRE AND FROM HIGH FIRE TO LOW FIRE TO OFF TO MAINTAIN THE REQUIRED WATER TEMPERATURE. IN ADDITION, THE CONTROLLER SHALL ADJUST THE 2-POSITION COMBUSTION AIR CONTROL AS NECESSARY TO MAITAIN WATER TEMPERATURE CONTROL.

THE BOILER CONTROLS SHALL ENSURE THAT THE MINIMUM WATER TEMPERATURE WITHIN THE BOILER IS NOT LESS THAN 140°F AND A MAXIMUM OF 200°F LEAVING THE BOILER. HOT WATER FLOW MUST BE PROVEN (THRU FS) BEFORE THE BOILER CONTROLS CAN BE ENERGIZED.

LEGEND	
C	COMMON
DA	DIRECT ACTING
DIFF	DIFFERENTAIL
EA	EXHAUST AIR
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
OA	OUTSIDE AIR
RA	RETURN AIR
SP	SETPOINT
TR	THROTTLING RANGE
⬡	ELECTRICAL TERMINAL POINT
■	MOUNT IN SPACE
▲	MOUNT IN UNIT CONTROL PANEL

EXAMPLE FINAL DESIGN

$$ – THINK VALUE ENGINEERING – $$

Revisions			
Symbol	Descriptions	Date	Approved

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
OMAHA, NEBRASKA

Designed by: G.D.R.	SITE NAME: OMAHA DISTRICT DESIGN GUIDE	SITE LOCATION
Drawn by: S.L.M.	HVAC CONTROLS (HW SYSTEM)	
Checked by: R.R.T.		
Reviewed by: K.A.H.	Plot Scale Ratio: 1:12 / Design File: STD07: oddgm602.dgn	Date: JUNE 2002
Submitted by: Chief: MECH. FAC. Section	Spec. No.: DACA 45 / Contract No.: DACA 45	Drawing Code: X
COMPUTER AIDED DESIGN & DRAFTING		Sheet reference number: M6.2

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